Claims

1. An apparatus for manufacturing a fiberoptic device, comprising:

a first stage;

a fiber rotator disposed on said first stage, said fiber rotator carrying an optical fiber therein, and rotating said optical fiber about an optical axis thereof;

a second stage for holding a silicon slab;

a fiber gripping assembly disposed between said first stage and said second stage for gripping an intermediate portion of said optical fiber;

a first viewer directed toward said silicon slab along a Y-axis;

a second viewer directed toward an end face of said optical fiber in a Z-axis;

wherein responsive to views displayed by said first viewer and said second viewer, said first stage, said second stage, said fiber rotator, and said fiber gripping assembly are adjustable to establish said optical fiber in a desired position on said silicon slab.

2. The apparatus according to claim 1, further comprising:

a third stage;

a weight, mounted on said third stage, wherein a free end of said weight impinges on said optical fiber to urge an end portion of said optical fiber onto said silicon slab.

3. The apparatus according to claim 2, wherein said third stage is movable on an X-axis and said Z-axis.

4. The apparatus according to claim 2, wherein said weight is pivotally mounted and pivots between a first position wherein said weight is in a non-contacting relationship with said optical fiber and a second position wherein said weight impinges on said optical fiber.

5. The apparatus according to claim 2, wherein said weight comprises:

a first weight that urges said end portion of said optical fiber into a groove formed in said silicon slab; and

a second weight that urges said end portion of said optical fiber onto a flat portion of said silicon slab.

6. The apparatus according to claim 2, wherein a contacting surface of said free end of said weight is parallel to a top portion of said silicon slab when said contacting surface is in contact with said optical fiber.

7. The apparatus according to claim 1, wherein said fiber gripping assembly is supplied by a vacuum line, and includes a channel formed therein for establishing fluid communication between said vacuum line and a tip portion of said fiber gripping assembly;

wherein said optical fiber is held in said tip portion of said fiber gripping assembly by suction transmitted via said channel.

8. The apparatus according to claim 7, wherein said tip portion has a groove formed therein, and said optical fiber is received in said groove.

9. The apparatus according to claim 8, wherein said groove is dimensioned such that a surface of said optical fiber contacts a first side wall of said groove and contacts a second side wall of said groove.

10. The apparatus according to claim 1, wherein said first stage is movable on a vertical axis and is rotatable about said vertical axis.

11. The apparatus according to claim 1, wherein said second stage is movable about said Y-axis.

12. The apparatus according to claim 1, wherein said second stage is connected to a vacuum line and said silicon slab is exposed to vacuum transmitted via said vacuum line.

13. The apparatus according to claim 1, wherein said second viewer comprises a power and polarization detector, and said second viewer is linked to a robot that actuates at least one of said first stage, and said second stage.

14. The apparatus according to claim 13, wherein said first viewer is linked to said robot.

15. A method of manufacturing a fiberoptic array, comprising the steps of:

disposing a slab on an assembly station;

gripping an optical fiber in a first gripping assembly for rotation about a Z-axis therein;

gripping said optical fiber in a second gripping assembly for displacement thereof in an X-axis and a Y-axis;

visualizing a position of said optical fiber relative said slab; and

responsive to said step of visualizing, adjusting said position to a desired position; and

permanently affixing said optical fiber to said slab in said desired position.

16. The method according to claim 15, further comprising the steps of:

attaching a housing to said slab, wherein said optical fiber is enclosed in said housing.

17. The method according to claim 16, further comprising the steps of:

forming a first groove in said slab;

forming a second groove in said housing,

wherein said optical fiber is embraced by said first groove and said second groove.

18. The method according to claim 15, further comprising the steps of:

visualizing a polarization axis of said optical fiber;

responsive to said step of visualizing, rotating said optical fiber about said Z-axis until said polarization axis attains a desired alignment.

19. The method according to claim 15, further comprising the steps of:

applying a weight to an intermediate portion of said optical fiber while performing said step of adjusting said position.

20. An apparatus for manufacturing a fiberoptic device, comprising:

a first stage;

a fiber rotator disposed on said first stage, said fiber rotator carrying an optical fiber therein, and rotating said optical fiber about an optical axis thereof;

a second stage for holding a slab;

a fiber gripping assembly disposed between said first stage and said second stage for gripping an intermediate portion of said optical fiber, wherein said fiber gripping assembly is supplied by a first vacuum line, and includes a channel formed therein for establishing fluid communication between said first vacuum line and a tip portion of said fiber gripping assembly, said optical fiber being held in said tip portion of said fiber gripping assembly by suction transmitted via said channel, wherein a groove is formed in said tip portion, said groove being dimensioned such that a surface of said optical fiber contacts a first side wall of said groove and contacts a second side wall of said groove;

a first viewer directed toward said slab along a Y-axis;

a second viewer directed toward an end face of said optical fiber in a Z-axis;

a third stage is movable on an X-axis and said Z-axis;

a first weight and a second weight, mounted on said third stage, wherein a free end of said first weight and a free end of said second weight impinge on said optical fiber to urge an end portion of said optical fiber against said slab.

wherein responsive to said first viewer and said second viewer, said first stage, said second stage, said fiber rotator, and said fiber gripping assembly are manipulated to establish said optical fiber in a desired position on said slab.

21. The apparatus according to claim 20, wherein said first weight and said second weight are pivotally mounted and independently pivot between first positions comprising a non-contacting relationship with said optical fiber and second positions of impingement on said optical fiber.

22. The apparatus according to claim 20, wherein said first stage is movable on a vertical axis and is rotatable about said vertical axis.

23. The apparatus according to claim 20, wherein said second stage is movable about said Y-axis.

24. The apparatus according to claim 20, wherein said second stage is connected to a second vacuum line and said slab is exposed to vacuum transmitted via said second vacuum line.